UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,636	11/25/2003	Robert M. Zeidman		4253

7590 03/30/2007		**EXAMINER**
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ART UNIT	PAPER NUMBER
2192	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/720,636	ZEIDMAN, ROBERT M.
	Examiner	Art Unit	
	J. Derek Rutten	2192	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>25 November 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-22</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-22</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>25 November 2003</u> is/are: a)☐ accepted or b)☒ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date <u>11/25/03</u>.

4)☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-22 have been examined.

Information Disclosure Statement

2.   The information disclosure statement filed 11/25/03 fails to comply with the provisions

of 37 CFR 1.97, 1.98 and MPEP § 609 because it was not submitted with a legible copy of each

publication or that portion which caused it to be listed as required by 37 CFR 1.98 (see MPEP

609.04(a)(II)). It has been placed in the application file, but the information referred to therein

has not been considered as to the merits. Applicant is advised that the date of any re-submission

of any item of information contained in this information disclosure statement or the submission

of any missing element(s) will be the date of submission for purposes of determining compliance

with the requirements based on the time of filing the statement, including all certification

requirements for statements under 37 CFR 1.97(e). See MPEP § 609.05(a).

Drawings

3.   Figures 1-5 should be designated by a legend such as --Prior Art-- because only that

which is old is illustrated. Each figure is described in applicant's "Background of the Invention"

(see pages 1-6) and the "Brief Description of the Drawings" (see page 7) in terms of the prior art.

See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in

reply to the Office action to avoid abandonment of the application. The replacement sheet(s)

should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to

obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the

applicant will be notified and informed of any required corrective action in the next Office

action. The objection to the drawings will not be held in abeyance.

Claim Objections

4.   Claim 7 is objected to for the following informalities: Line 518 as appearing on page 17

in claim 7 contains the following phrase "in as a second." This appears to be a typo which

should instead read --in as a second--. Correction is required.

Claim Rejections - 35 USC § 112

5.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the
> subject matter which the applicant regards as his invention.

6.   Claim 13 recites the limitation "The apparatus of claim 11)" in line 1. There is

insufficient antecedent basis for this limitation in the claim. For the purpose of further

examination, claim 13 will be interpreted as being dependent upon claim 12.

Claim Rejections - 35 USC § 101

7.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

8.   Claims 1-22 are rejected under 35 U.S.C. 101 because the claimed inventions are directed

to non-statutory subject matter.

Claims 1-11 are directed to a method for comparing two source code files. This claimed

subject matter lacks a practical application of a judicial exception (law of nature, abstract idea,

naturally occurring article/phenomenon) since it fails to produce a useful, concrete and tangible

result. Specifically, the claimed subject matter does not produce a tangible result because the

claimed subject matter fails to produce a result that is limited to having real world value rather

than a result that may be interpreted to be abstract in nature as, for example, a thought, a

computation, or manipulated data. More specifically, the claimed subject matter provides for

finding match characters (claims 1-10) or deriving a metric (claim 11). This produced result

remains in the abstract and, thus, fails to achieve the required status of having real world value.

In contrast, the specification describes the tangible result of a user viewing a report that shows

results (see page 13, lines 420-421). Such a step would provide a tangible result and would be

statutory. See MPEP 2106(IV)(C)(2)(2)(b) "Tangible Result."

Claims 14-22 are directed to a system for comparing two source code files. These claims

fail to produce a tangible result for the same reasons set forth in the rejection of claims 1-11

above.

Claim Rejections - 35 USC § 103

9.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

10.   Claims 1, 3, 12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over ":-
)When you grade that: using e-mail and the network in programming courses" by Arnow

(hereinafter "Arnow") in view of "Strings" by Worthington (hereinafter "Worthington").

        In regard to claim 1, Arnow discloses:

        A method for comparing two program source code files to help an expert

determine whether one file contains source code that has been copied from the other file

or whether both files contain code that has been copied from a third file, (See page 13,

2nd column, 2nd paragraph, e.g. "plagiarism detector...carries out a number of

transformations") *the method comprising*

        a) eliminating programming comments from the first source code file; b)

eliminating programming comments from the second source code file; See page 13, 2nd

column, 2nd paragraph. This provides a description of separating program code into two

files, one of which containing only programming code and no comments. This is done

for "each student's code." That is, a first and second source code file.

        c) substituting a single space character for sequences of whitespace characters in

each remaining line of functional programming code in said first file; d) substituting a

single space character for sequences of whitespace characters in each remaining line of

functional programming code in said second file; See page 13, 2nd column, 2nd paragraph,

e.g. "spaces and tab sequences are reduced to single spaces."

        ... and

g) finding all matches between text strings in said first array with text strings in said second array. See page 13, 2nd column, 2nd paragraph, e.g. "pairwise comparison."

Arnow does not expressly disclose: *e) putting each remaining line of functional programming code of the first file into an array of text strings; f) putting each remaining line of functional programming code of the second file into a second array of text strings;* However, Worthington teaches using arrays to store strings. See top of page 3, e.g. "It is often useful to store strings in arrays." It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Worthington's array of strings to store Arnow's program code in order to utilize the useful nature of arrays as suggested by Worthington.

In regard to claim 3, Arnow discloses:

A method for comparing two program source code files to help an expert determine whether one file contains source code that has been copied from the other file or whether both files contain code that has been copied from a third file, (See page 13, 2nd column, 2nd paragraph, e.g. "plagiarism detector...carries out a number of transformations") *the method comprising*

a) eliminating functional programming lines from the first source code file, leaving comment lines; b) eliminating functional programming lines from the second source code file, leaving comment lines; See page 13, 2nd column, 2nd paragraph. This provides a description of separating program code into two files, one of which containing

only comments and no functional programming. This is done for "each student's code."
That is, a first and second source code file.

c) substituting a single space character for sequences of whitespace characters in each remaining comment line in said first file; d) substituting a single space character for sequences of whitespace characters in each remaining comment line in said second file; See page 13, 2nd column, 2nd paragraph, e.g. "spaces and tab sequences are reduced to single spaces."

... and

g) finding all matches between text strings in said first array with text strings in said second array. See page 13, 2nd column, 2nd paragraph, e.g. "pairwise comparison."

Arnow does not expressly disclose: *e) putting each remaining comment line of the first file into an array of text strings; f) putting each remaining comment line of the second file into a second array of text strings;* However, Worthington teaches using arrays to store strings. See top of page 3, e.g. "It is often useful to store strings in arrays." It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Worthington's array of strings to store Arnow's program code in order to utilize the useful nature of arrays as suggested by Worthington.

In regard to claim 12, Arnow discloses a system comprising a computer. See page 10 column 2 paragraphs 2 and 3, e.g. "Sun IPCs." All further limitations have been addressed in the above rejection of claim 1.

In regard to claim 14, all limitations have been addressed in the above rejections of claims 3 and 12.

11.	Claims 2, 4-8, 11, 13, and 16-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Arnow in view of Worthington as applied to claim 1 above, and further in view of "Plagiarism in natural and programming languages: an overview of current tools and technologies" by Clough (hereinafter "Clough").

In regard to claim 2, the above rejection of claim 1 is incorporated. Arnow and Worthington does not expressly disclose: *where finding all matches ignores the type case of the text.* However, Clough teaches that the YAP system translates upper-case letters to lower case letters. See page 24 under "Preprocess the submitted reports." It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Clough's case translation with Arnow's program code in order to preprocess text for tokenization as suggested by Clough.

In regard to claim 4, the above rejection of claim 3 is incorporated. All further limitations have been addressed in the above rejection of claim 2.

In regard to claim 5, Arnow discloses:

A method for comparing two program source code files to help an expert

determine whether one file contains source code that has been copied from the other file

or whether both files contain code that has been copied from a third file, (See page 13,
2nd column, 2nd paragraph, e.g. "plagiarism detector...carries out a number of
transformations") *the method comprising*

...

   b) eliminating programming language keywords from said array of text strings;
... d) eliminating programming language keywords from said second array of text
strings; See page 13, 2nd column, 2nd paragraph, e.g. "one containing only the identifiers,
the other only the keywords and operators."

   e) finding all matches between text strings in said first array with text strings in
said second array. See page 13, 2nd column, 2nd paragraph, e.g. "pairwise comparison."

   Arnow does not expressly disclose: *a) extracting all words between whitespace*
from each line of functional programming code in the first source code file to an array of
text strings; ...c) extracting all words between whitespace from each line of functional
programming code in the second source code file to a second array of text strings;
However, Clough teaches document comparison based on word use. See bottom of page
11 "show the number of words in common." It would have been obvious to one of
ordinary skill at the time the invention was made, to use Clough's teaching of word
matching with Arnow's keyword elimination in order to identify documents that contain
similar passages, as suggested by Clough (see bottom of page 11). Also, Worthington
teaches using arrays to store strings. See top of page 3, e.g. "It is often useful to store
strings in arrays." It would have been obvious to one of ordinary skill in the art at the

time the invention was made to use Worthington's array of strings to store Arnow's

program code in order to utilize the useful nature of arrays as suggested by Worthington.

In regard to claim 6, the above rejection of claim 5 is incorporated. All further

limitations have been addressed in the above rejection of claim 2.

In regard to claim 7, Arnow and Worthington do not expressly disclose: *e) finding

all partial matches between text strings in said first array with text strings in said second

array, where a partial match is where one string can be found in its entirety in as a

second string but the strings are not identical.* However, Clough teaches matching

substrings. See page 22, bulleted list in section 4.1.3, e.g. "q as a substring of S." It

would have been obvious to one of ordinary skill at the time the invention was made, to

use Clough's teaching of substring matching with Arnow's plagiarism detector in order to

detect systemic changes to variable names as suggested by Clough (see 1st paragraph in

section 4.1.3). All further limitations have been addressed in the above rejection of claim

5.

In regard to claim 8, the above rejection of claim 7 is incorporated. All further

limitations have been addressed in the above rejection of claim 2.

In regard to claim 11, Arnow discloses:

A method for comparing two program source code files, (See page 13, 2nd

column, 2nd paragraph, e.g. "plagiarism detector...carries out a number of

transformations") *comprising:*

a) *extracting from each program source code file a first set of code elements and*

a second set of code elements; See page 13, 2nd column, 2nd paragraph. This provides a

description of separating program code into two files, one of which containing only

programming code and no comments. This is done for "each student's code." That is, a

first and second source code file.

b) *computing a first metric derived from comparing the first set of code elements*

for the first program source code file to the first set of code elements for the second

program source code file; See page 13, 2nd column, 2nd paragraph, e.g., "smaller

numbers suggesting plagiarism"

c) *computing a second metric derived from comparing the second set of code*

elements for the first program source code file to the second set of code elements for the

second program source code file; See page 13, 2nd column, 2nd paragraph. Arnow

provides for the comparison at least of comments and programming code. As such, at

least two metrics are derived.

d) *combining the first metric and the second metric to derive a combined metric,* See

page 13, 2nd column, 2nd paragraph, e.g. "smaller numbers suggesting plagiarism." This

suggests that for each set of files, Arnow computes a metric and combines them to arrive

at a "number" which provides an indication of plagiarism. *wherein the first and second*

sets of code elements are selected from the group consisting of selected source lines See

page 13, 2nd column, 2nd paragraph, e.g. "identifiers", *selected comment lines* See page

13, 2nd column, 2nd paragraph, e.g. "comments," *and selected code sequences* See page

13, 2nd column, 2nd paragraph, e.g. "keywords". Arnow does not expressly disclose

wherein the first and second sets of code elements are selected from the group consisting

of complete words, selected partial words. However, Clough teaches searching for

complete and partial words. See bottom of page 11 "show the number of words in

common." It would have been obvious to one of ordinary skill at the time the invention

was made, to use Clough's teaching of word matching with Arnow's keyword

elimination in order to identify documents that contain similar passages, as suggested by

Clough (see bottom of page 11). Also see page 22, bulleted list in section 4.1.3, e.g. "q

as a substring of S." It would have been obvious to one of ordinary skill at the time the

invention was made, to use Clough's teaching of substring matching with Arnow's

plagiarism detector in order to detect systemic changes to variable names as suggested by

Clough (see 1st paragraph in section 4.1.3).

In regard to claim 13, the above rejection of claim 12 is incorporated. All further

limitations have been addressed in the above rejection of claim 2.

In regard to claim 16, all limitations have been addressed in the above rejections

of claims 5 and 12.

In regard to claim 17, the above rejection of claim 16 is incorporated. All further limitations have been addressed in the above rejection of claim 2.

In regard to claim 18, all limitations have been addressed in the above rejections of claims 7 and 12.

In regard to claim 19, the above rejection of claim 18 is incorporated. All further limitations have been addressed in the above rejection of claim 2.

12.   Claims 9 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnow in view of Worthington as applied to claim 1 above, and further in view of "TLA+ Mode: Editing Features" by Wegmann (hereinafter "Wegmann").

In regard to claim 9, Arnow discloses using keywords to find matching code. See page 13, 2nd column, 2nd paragraph, e.g. "the other only keywords and operators." Arnow and Worthington do not expressly disclose: *g) finding sequences where the first word of each line in said first array matches the first word of each line in said second array.* However, Wegmann teaches that keywords are found at the beginning of a line. See page 4, 3rd paragraph under "Formatting and Indenting," e.g. "The keywords whose templates can be inserted all start at the very beginning of a line." It would have been obvious to one of ordinary skill at the time the invention was made, to use Wegmann's teaching of the location of keywords with Arnow's keyword matching in order to easily find the

likely location of keywords as suggested by Wegmann. All further limitations have been addressed in the above rejection of claim 1.

In regard to claim 20, all limitations have been addressed in the above rejections of claims 9 and 12.

13.   Claims 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arnow in view of Worthington in view Wegmann as applied to claim 9 above, and further in view of Clough.

In regard to claim 10, the above rejection of claim 9 is incorporated. Arnow, Worthington, and Wegmann do not expressly disclose: *where finding sequences where the first word of each line in said first array matches the first word of each line in said second array ignores the type case of the text*. However, Clough teaches that the YAP system translates upper-case letters to lower case letters. See page 24 under "Preprocess the submitted reports." It would have been obvious to one of ordinary skill in the art at the time the invention was made to use Clough's case translation with Arnow's program code in order to preprocess text for tokenization as suggested by Clough.

In regard to claim 21, the above rejection of claim 20 is incorporated. All further limitations have been addressed in the above rejection of claim 10.

Conclusion

14.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to J. Derek Rutten whose telephone number is (571)272-3703. The examiner can normally be reached on M-F 7:00-3:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571)272-3695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

jdr

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SUPERVISORY PATENT EXAMINER